

CLAIMS

What is claimed is:

1. A cryogenic pipeline comprising:

a bulkhead having an inner transition element, and a first and second outer transition
5 element coupled to and at least partially surrounding the inner transition element;

wherein the inner transition element forms a conduit that transfers cryogenic product
from a first cryogenic pipeline to a second cryogenic pipeline; and

wherein the first and second outer transition elements couple a first and second jacket
pipeline to the first and second cryogenic pipelines, respectively, such that thermal
10 stress load in the first and second cryogenic pipelines is transferred to the first and
second jacket pipelines, respectively.

2. The pipeline of claim 1 wherein the inner transition element has a pipe configuration
with an inner diameter that is substantially identical to an inner diameter of the first
and second cryogenic pipelines.

- 15 3. The pipeline of claim 1 wherein at least one of the outer transition elements has an
outer diameter that is substantially identical to an outer diameter of the first and
second jacket pipelines.

4. The pipeline of claim 1 further comprising a sleeve disposed in a space between the
first and second outer transition elements.

- 20 5. The pipeline of claim 1 wherein at least one of the inner transition element and the
first and second cryogenic pipelines are at least partially enclosed by an insulating
material.

6. The pipeline of claim 1 further comprising an external insulation that covers the first
and second outer transition element.

- 25 7. The pipeline of claim 1 wherein the inner transition elements and the outer transition
elements are contiguous.

8. The pipeline of claim 1 further comprising a weight coating coupled to at least one of the first and second jacket pipelines.
9. A field joint for a cryogenic pipe-in-pipe pipeline, in which an inner portion of the field joint fluidly couples a first and a second section of a product conduit of the pipeline, in which an outer portion couples a first and a second section of a jacket of the pipeline, and in which inner and outer portions are coupled together such that a thermal stress load from the first and a second sections of the product conduit is transferred to the first and second sections of the jacket in the pipeline, respectively.
10. The field joint of claim 9 wherein the outer portion is separated into two ring-shaped elements that are coupled to the inner portion via an angled connector.
11. The field joint of claim 10 wherein a sleeve is disposed in a space between the two ring-shaped elements.
12. The field joint of claim 9 further comprising insulating material coupled to at least one of the product conduit and the inner portion.
13. The field joint of claim 9 further comprising insulating material that covers the outer portion to form an external insulation.
14. The field joint of claim 9 wherein the inner and outer portions are contiguous.
15. A method of coupling first and second pipe-in-pipe pipelines, comprising:
providing a field joint having an inner portion and an outer portion;
fluidly coupling the inner portion to a first and a second section of a product conduit in a pipe-in-pipe pipeline;
coupling the outer portion to a first and a second section of a jacket in the pipe-in-pipe pipeline; and
wherein the step of fluidly coupling and coupling is performed such that the inner and outer portions cooperate to transfer thermal stress loads from the first and second

sections of the product conduit to the first and second sections of the jacket in the pipe-in-pipe pipeline, respectively.

16. The method of claim 15 wherein the pipe-in-pipe pipeline is a cryogenic pipe-in-pipe pipeline.
- 5 17. The method of claim 15 wherein the step of fluidly coupling comprises welding.
18. The method of claim 15 further comprising a step of coupling insulation material to at least one of the first and a second section of the product conduit.
19. The method of claim 15 further comprising a step of coupling a spacer to at least one of the first and a second section of the product conduit to maintain a distance between
10 the product conduit and the jacket.
20. The method of claim 15 further comprising a step of coupling a weight to at least one of the first and second section of the jacket.